

Patent claims

5 1. An electrochemical arrangement such as a fuel cell arrangement (14), and electrolyser or an electrochemical compressor, which is designed as a composite of several layers (10, 11, 12), with at least one distribution structure (1) for incorporating and distributing a medium, characterised in that the distribution structure (1) is led in a plane and is elastic in a controlled manner counter to pressure loading (F) perpendicular to the plane.

10 2. An electrochemical arrangement according to claim 1, characterised in that the distribution structure (1) is realised by a spatially structured layer (9) in this composite.

15 3. An electrochemical arrangement according to claim 2, characterised in that the layer composite is created by surface pressing (F).

20 4. An electrochemical arrangement according to one of the claims 2 or 3, characterised in that the layers of the composite are held together by clamping elements.

25 5. An electrochemical arrangement according to one of the claims 2 to 4, characterised in that further bipolar plates (10), preferably at least one cooling plate as well as sealing elements (13) are in positive engagement to one another in the composite, wherein the distribution structure (1) runs between the bipolar plates (10).

30 6. An electrochemical arrangement according to one of the claims 1 to 5, characterised in that the distribution structure (1) runs from its entry to its exit in an uninterrupted manner.

35 7. An electrochemical arrangement according to one of the claims 1 to 6, characterised in that the distribution structure (1) in the unloaded condition has a trapezoidal cross section (2, 3).

8. An electrochemical arrangement according to one of the claims 1 to 6, characterised in that the distribution structure (1) in the unloaded condition has an approximately parabolic cross section (2, 3).

5 9. An electrochemical arrangement according to one of the claims 1 to 6, characterised in that the distribution structure in the unloaded condition has an approximately omega-shaped cross section.

10 10. An electrochemical arrangement according to one of the claims 1 to 9, characterised in that the elasticity of the distribution structure (1) in particular lies in the deformability of the planar-parallel side (2) of the distribution structure cross section.

15 11. An electrochemical arrangement according to one of the claims 11 to 10, characterised in that the elasticity of the distribution structure (1) in particular lies in the deformability of the side walls (3).

20 12. An electrochemical arrangement according to one of the claims 1 to 11, characterised in that the distribution structure is represented by way of punching-like projections which appear out of the plane like islands.

13. An electrochemical arrangement according to one of the claims 1 to 11, characterised in that the distribution structure is represented by a channel.

25 14. An electrochemical arrangement according to one of the claims 1 to 13, characterised in that the elasticity is set by way of a partial tapering of the material thickness.

30 15. An electrochemical arrangement according to one of the claims 1 to 14, characterised in that the distribution structure has partially different elasticities along its course.

35 16. An electrochemical arrangement according to one of the claims 1 to 15, characterised in that the distribution structure is formed amid the use of graphite, graphite-filled plastics or conductive plastics of the same type.

17. An electrochemical arrangement according to one of the preceding claims, characterised in that the distribution structure is designed as a media-tight plate (9', 9'', 9''').
- 5 18. An electrochemical arrangement according to one of the preceding claims, characterised in that the spring rate of the plate (9, 9', 9'') in the direction of the layering of the electrochemical arrangement is between 0.5 and 50 kN/mm per square centimetre.
- 10 19. An electronic arrangement according to one of the preceding claims, characterised in that the plate (9', 9'', 9''') separates two complementary spaces (a, a') for media distribution.
- 15 20. An electrochemical arrangement according to claim 19, characterised in that the complementary spaces (a, a') lie in a plane (x, y) perpendicular to the direction of the layering (z) at least partly next to one another.
- 20 21. An electrochemical arrangement according to one of the preceding claims, characterised in that the plate is designed as a cooling plate (9') or as a part (9'', 9''') of a bipolar plate.